

Lingual Guttering Technique for Removal of Impacted Mandibular Third Molars

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Abstract:

Background: To assess the clinical feasibility of lingual bone guttering technique for surgical extraction of mandibular third molars.

Materials and Methods: 20 patients with thick lingual cortical plate were included in the study. Surgical extraction of mandibular third molars by lingual bone guttering technique was performed in all the subjects. These subjects were evaluated for integrity of lingual cortical plate and sensation of lingual nerve postoperatively. **Results:** All extractions done by lingual bone guttering technique were clinically feasible to perform and no complications were seen. **Conclusion:** Lingual bone guttering technique can be used safely in extraction of mandibular third molars with thick lingual cortical plate.

Key Words: Impaction, lingual bone guttering, lingual plate fracture, nerve injury

Introduction

The most commonly performed surgical procedure in oral and maxillofacial surgery practices is the removal of impacted third molars. Extensive training, skill, and experience allow this procedure to be performed in an atraumatic fashion with local anesthesia, sedation, or general anesthesia (Figure 1).

Accessibility significantly influences the degree of difficulty encountered during removal of a third molar. The ease with which the tooth can be extracted depends on the degree of surgical exposure, creation of a pathway for tooth delivery, and

the ability to gain purchase (natural or surgically prepared) on the tooth.¹

Out of the factors contributing to the post-operative morbidity, the most responsible one is the trauma from bone cutting due to the significant bone removal, which is carried out either by using chisel, osteotome and mallet or by rotary cutting instruments.²

The commonly used techniques for removal of third molars are removal of bone from buccal and distal side or the lingual bone split technique. Third molars in most of its impaction locations are covered with significant amount of bone buccally as compared to the lingual side. In many situations lingual plate comprises of <1 mm thick cortical bone (Figure 2).³

There are also many cases in which the lingual cortical plate is thick and obstructs the easy removal of third molar with no mention of such possibility in the literature. Inadvertent force by elevators in such situation ultimately lead to excessive forces on the lingual plate which results in fracture of the lingual cortical plate and hence chances of lingual nerve damage are increased.

Following case series, includes 20 patients with thick lingual cortical plate in the mandibular third molar area and lingual guttering method used for removal of these teeth.

Materials and Methods

Twenty (13 male, 7 female) patients with symptomatic lower third molar and significantly thick lingual cortical plate were



Figure 1: Intra-oral periapical showing horizontally impacted mandibular third molar.

included. Thick lingual plate can be identified by (1) palpation (2) buccoversion of tooth and (3) buccally placed tooth. After recording a thorough case history, clinical examination was carried out for all cases followed by routine blood investigations and specific investigation whenever required. Intra-oral periapical radiograph and orthopantomograph was done for every patient.

All cases were operated under local anesthesia (lignocaine with 1:80000 adrenaline). Inferior alveolar, lingual and long buccal nerve blocks were administered, and desired local anesthesia was achieved.

A standard incision (Wards's incision)⁴ was made in all cases. The tissue flap was reflected buccally, distally, and lingually to expose the tooth and surrounding alveolar bone. The wide end of Hawarth's elevator was inserted adjacent to lingual plate, so as to protect the lingual nerve.

Bone guttering was carried out on the buccal, distal and lingual side using straight fissure bur in low speed micrometer straight hand piece under copious irrigation (Figure 3).

Tooth was sectioned if needed. Tooth elevated and delivered out of the socket in toto or in parts using elevators or suitable forceps. Sharp edges if remaining on the bone were smoothened using bone file.

All the patients were evaluated for integrity of lingual bone plate and impairment of sensation in the area supplied by lingual nerve post-operatively.

Results

The study consisted of 20 patients in whom lingual cortical plate was found to be significantly thick. Hence, lingual guttering was carried out for extraction of third molar. In all the patients after extraction of the tooth, lingual plate was found to



Figure 2: Thick lingual plate can be seen after reflection of buccal and lingual flaps.

be intact. Lingual nerve sensation was normal on the follow-up appointment on next post-operative day (Figure 4).

Discussion

A well-known complication during third molar extractions is injury and severance of the lingual nerve. Thoma stated that, negligence is the major factor causing injury to the lingual nerve.⁵ Singh *et al.* in her study stated that difficulty in surgical management of impacted third molar is due to its anatomical position, poor accessibility, and potential injuries to the surrounding vital structures including nerves, vessels, soft tissues, and adjacent teeth.² Complications of the third molar surgery are well documented in the literature and extensive studies have been performed to avoid these complications.

The frequency of lingual nerve injuries during third molar removal ranges from 0.2 to 22% presenting with temporary sensory deficits and 0-2% having permanent sensory disturbances.⁶

The risk factors for lingual nerve damage include general anesthesia when compared to local anesthesia, unerupted teeth



Figure 3: Buccal, distal, and lingual guttering protecting the lingual flap.



Figure 4: Intact lingual cortical plate after extraction of tooth.

removal versus erupted teeth removal and use of Howarths periosteal elevator.⁷ Robinson *et al.*⁸ have advised not to reflect the lingual flap for third molar extraction whenever possible.

Pichler and Beirne⁹ stated that the most important etiologic factor for lingual nerve damage was the manipulation of the lingual flap or cortical bone because of the anatomic proximity between lingual nerve and the lower third molar.

Causes of lingual nerve damage are lingual plate perforation, lingual flap trauma during bone cutting, tooth sectioning, use of lingual retractor, use of chisel, lingual plate fracture and incision design. Pogrel, Rud and Yeh Hav stated that lingual flap retraction allows a higher protection to lingual nerve from permanent lesions despite the possibility of temporary lesions.¹⁰ Commercially available retractors used for lingual flap retraction include Hovell's (Braun Medical, Sheffield, UK), Rowe (Thackeray Medical), Howarth's, Mead's and Ward's elevators. It was found in the above case series that the elevation of lingual flap was easy due to considerable thickness of the lingual cortical plate. Though a skillful, precise and Subperiosteal reflection is necessary for better results.

Lingual bone splitting technique was introduced by Kelsey fry 1933¹¹ and was described in detail by James in 1936¹² and later by Ward in 1956.⁴ This technique was further modified by several authors. Davis *et al.*¹³ modified the distolingual splitting technique by not elevating the lingual periosteum when sectioning the lingual plate in pieces. In all the above techniques, there is a high chance of injury to the lingual nerve. Use of chisel and mallet for third molar removal under local anesthesia is very uncomfortable for the patient and its use is advised in patients under general anesthesia.

Accidental fractures of lingual plate during extraction of third molars are a well-known complication. As the lingual nerve is in very close proximity to this cortical plate, chances of damage to the nerve are high. Separation of this lingual plate from the lingual soft tissues increases the chances of lingual nerve damage. Furthermore, after removal of this fractured lingual plate the sharp edges of the bone may traumatize the lingual flap, leading to acute post-operative pain and ultimately injure the lingual nerve causing temporary or permanent lesions of the nerve. Hence to avoid fracturing of the lingual cortical plate following tooth removal a relatively safe technique of lingual guttering can be performed.

Conclusion

In patients with thick lingual cortical plate, lingual guttering technique can be used safely after elevating the lingual flap and using suitable lingual retractor. Furthermore, the chances of lingual nerve injury are significantly reduced with this technique.

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